MOTORCYCLE STUDIES IN MARYLAND

Univ. of Maryland

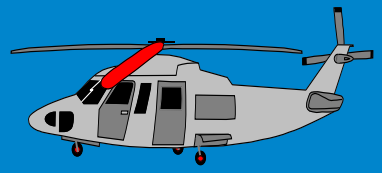
National Study Center for Trauma

Available Injury Data Sources in Maryland

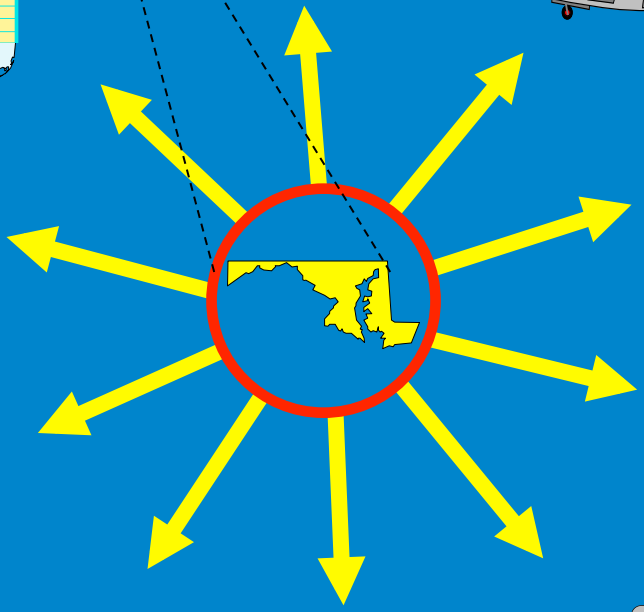
Driver Citations

Police Crash Reports

Ambulance & EMS Logs



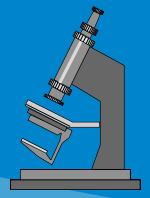
MVA Licensing



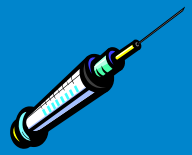
ED Data

Hospital Records

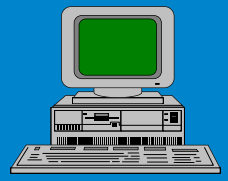
Vital Statistics



Autopsy Records



Toxicology



Statewide Trauma Registry

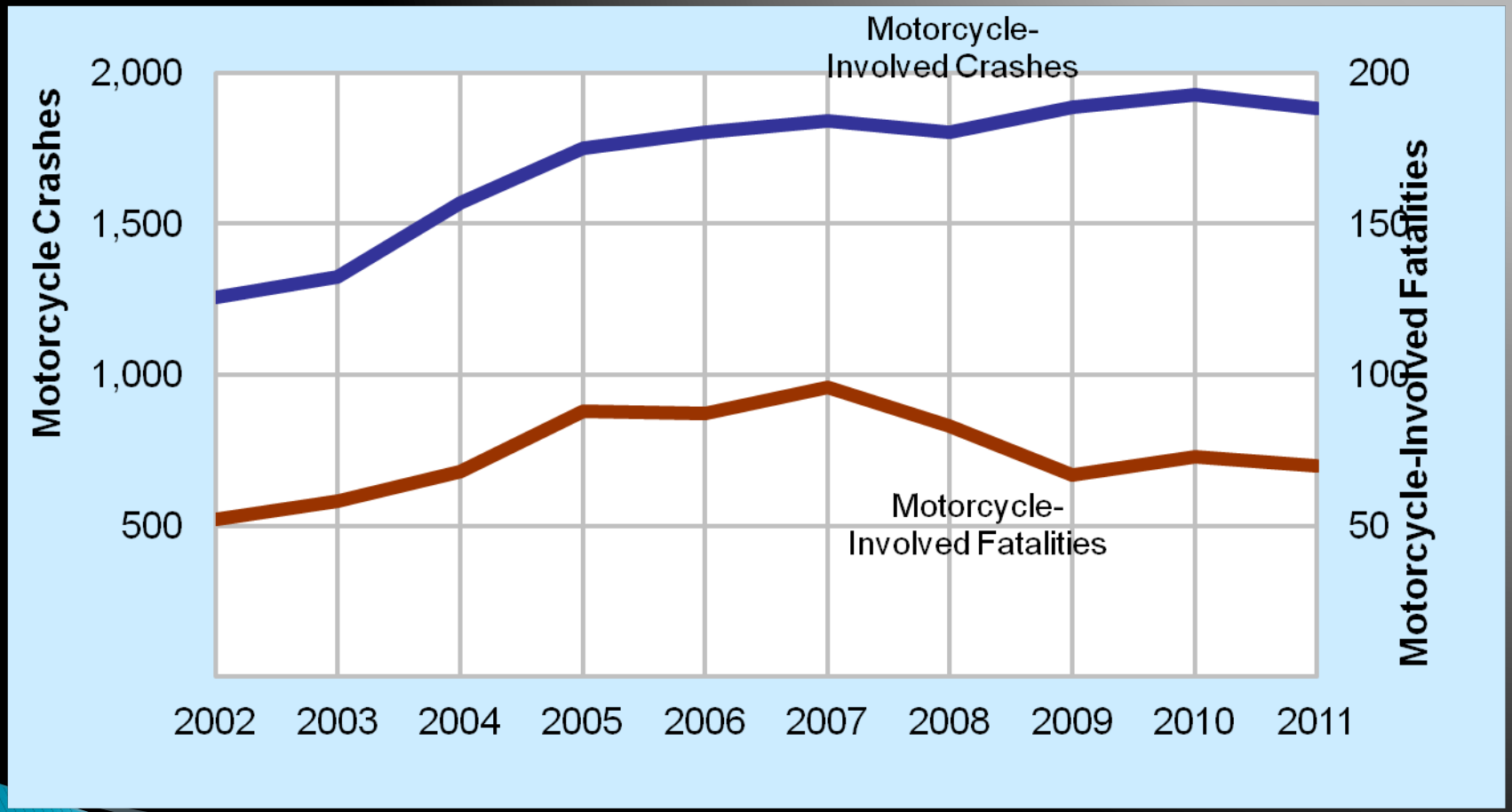
Crashes, Injuries and Fatalities nationally…

- Motorcyclist fatalities have decreased since 2007 by close to 27%, while total traffic fatalities decreased 21% during that period.
- There were 3% fewer injuries and 4% fewer fatalities in 2011compared to 2010.
- Motorcycle crash-related fatalities comprised *14.4%* of all traffic fatalities in 2011, down slightly from 14.7% in 2010.

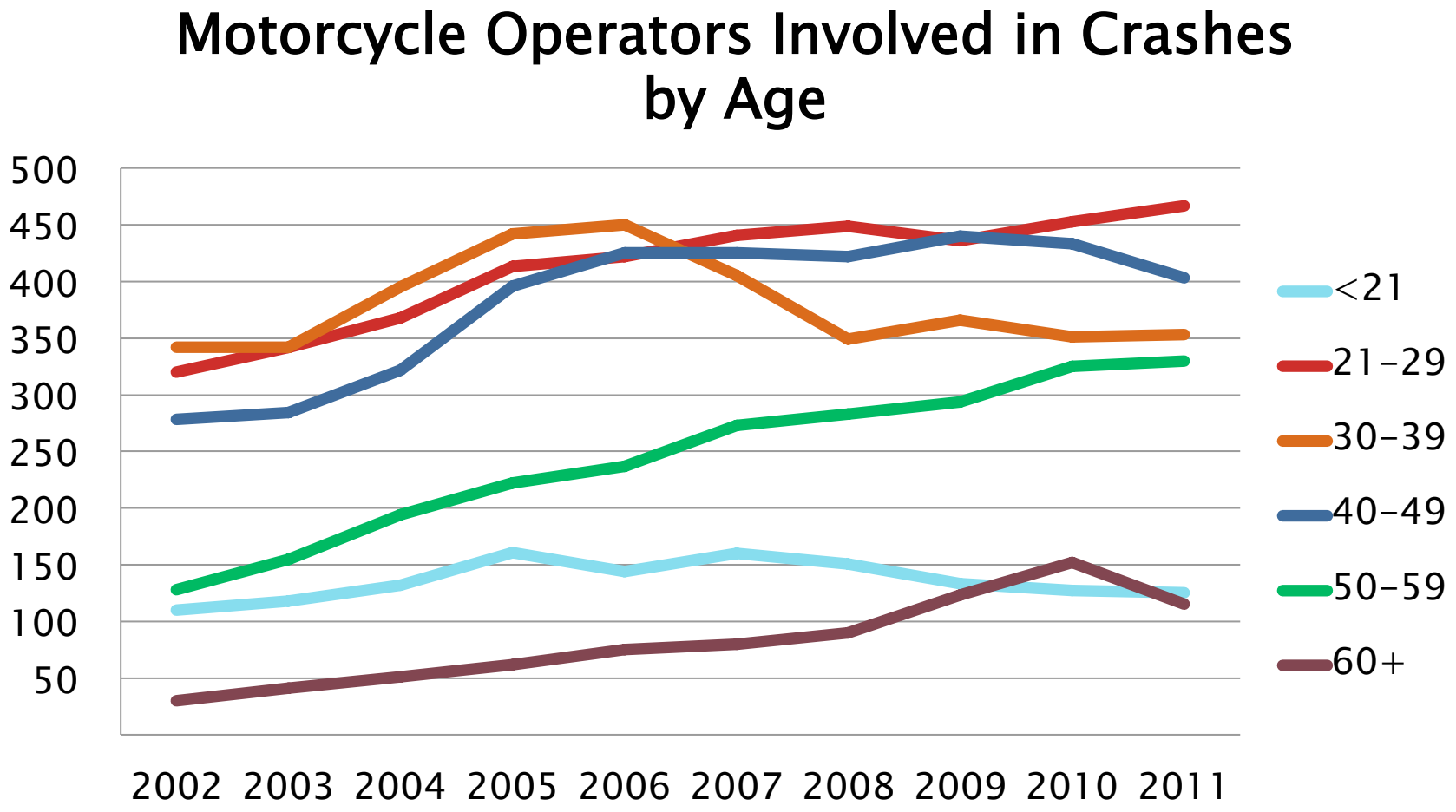
Maryland Trends

- Motorcycle registrations increased by 1.2% from 2009 to 2011
- Motorcycle licensure increased by 12% over the same period
- More than 10,000 people received a Class M endorsement in 2005

Maryland Motorcycle Data



Maryland Motorcycle Data



Top Contributing Circumstances in Motorist-Fault Collisions with MC

- Failure to Give Full Time and Attention
- Failure to Yield Right of Way
- Following Too Close
- Improper Turn

In Maryland in 2008…..

Table 1 – Motorcycle Crash and Rider Characteristics					
Total Riders Involved in Crashes				Riders Killed in Crashes	
	N	%		N	%
Gender					
Male	1,665	90		73	96
Age					
<20	89	4.8		3	3.9
20-34	686	37.1		30	39.5
35-49	596	32.2		27	35.5
50-64	332	18.0		14	18.4
65+	41	2.2		2	2.6
Helmet Use					
Yes	1,381	74.7		68	89.5
Unknown	308	16.7		2	2.6
Total Motorcycle Crashes				Fatal Motorcycle Crashes	
Day of Week					
Weekday	1,137	63.1		40	51.3
Weekend	666	36.9		38	48.7
Hour of Day					
12am – 8am	203	11.2		11	14.1
8am – 12pm	212	11.8		6	7.7
12pm – 8pm	1,078	59.8		47	60.2
8pm – 12am	310	17.2		14	17.9

Hospital Admission Charge Percentile

				Hospital Charges (Percentile)		
Mechanism	Number	Charge ($ in 1,000s)	Percent (%)	25th	Median	75th
Driver	3,132	60,945	45.7	3,923	5,650	14,996
Passenger	1,125	19,363	14.5	4,075	6,110	15,403
Motorcyclist	835	27,455	20.6	4,835	9,999	27,207
Pedal Cyclist	105	2,225	1.7	4,062	7,526	22,240
Pedestrian	736	18,171	13.6	4,588	9,083	25,455
Unspecified	247	5,110	3.8	4,281	7,066	18,201
Total	**6,180**	**133,269**	**100.0**	**4,104**	**6,396**	**17,713**

Maryland CODES - 2008

Licensure

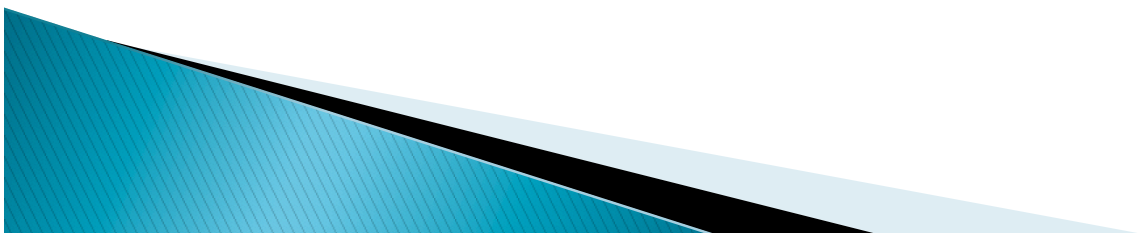
- In 2010:
- 2,037 motorcycle operators were involved in crashes
  - 1,544 were reported to have a MD license
    - 24% of total were out-of-state operators
  - 1,513 linked to MVA licensure files
    - 896 (59%) had an M endorsement on record
    - However, only 339 (22%) had an M in the class field on the crash report

Challenges

- Motorcycle safety is not just one problem, but several problems:
  - Rider Vulnerability
  - Rider Inexperience
  - Driver Inattention
  - Driver Awareness and Attitudes
  - Rider Impairment
  - Aggressive Riding

Rider Vulnerability

- Represent 2.5% of all registered motor vehicles
- Are involved in 15% of fatal motor vehicle collisions
- Motorcycle operators are 4 times more likely to be injured or die in a in a crash than other drivers
- 1 in 25 motorcycle crashes result in a fatality




Serious brain injury
Helmet with eye protection
Built-in shoulder protection
Shoulder injury
Abrasion resistant jacket
Heavy bruising
Built-in elbow protection
back injuries
Severe lacerations
Built-in back protectoin
Severe skin loss
Motorcycle gloves (reinforced and padded)
Hand and finger damage
Leather pants (abrasion resistant)
Infections from road contact
Built-in knee pads
Abrasions and nerve damage
Motorcycle boots (light, secure and reinforced)
Severe skin loss
Toes amputated

Question:
How well do helmets work to prevent deaths?

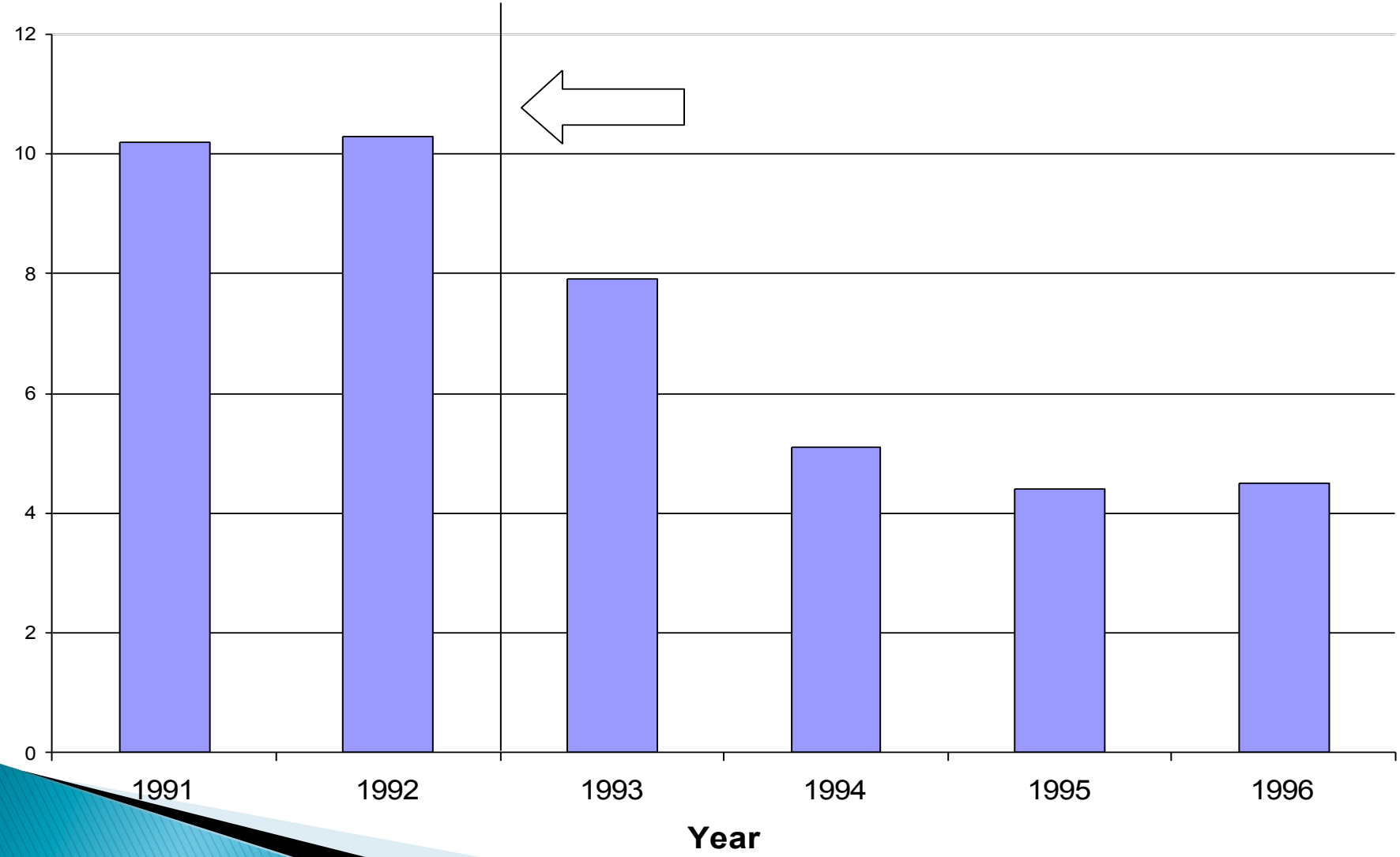
- Very well – can't prevent all deaths
- Reduce the chances of a traumatic brain injury
- Some helmets are not certified & will not provide protection (see example of bad helmet)

Estimated effectiveness of helmets

- Reduce chances of death in crash by 40% (Keng, 2005)
- National Highway Traffic Safety Administration: estimates helmets saved 1,316 motorcyclists' lives in 2004

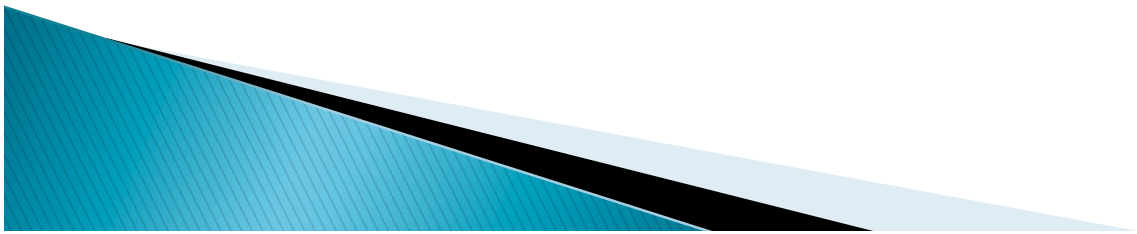
Deaths per 10,000 registered motorcycles before and after helmet law, Maryland

(Auman et al., 2002)



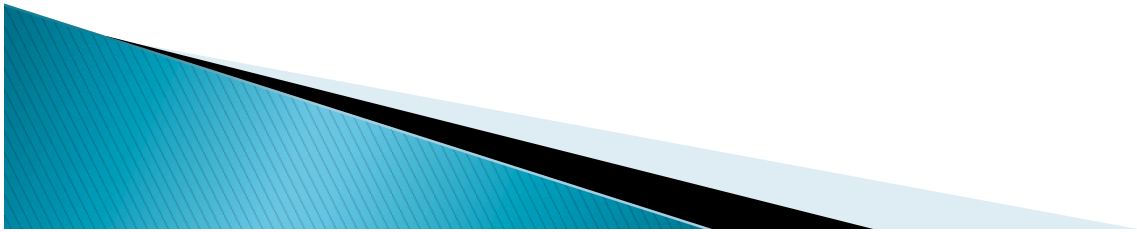
Motorcycle Research Projects

- Injury Patterns – Hospitalized Younger and Older Motorcycle Operators
- Driving Behavior – Motorcycle Training
- Data Collection – Promising Practices
- Characteristics of Motorcycle Operators in MD
  - Crash Statistics
  - Helmet Photographs
  - Motorcyclist Survey (riding behaviors)
  - SF-36 (psychosocial outcomes)



Characteristics of Motorcycle Operators

- 2007–2009 (n=189)
- 94% men
- 76% white
- Education
  - 21%<12th grade
  - 27% High School, GED
  - 23% Some College
  - 22% College Graduate or higher



Characteristics of Motorcycle Operators

- Motorcycle ridden most often
  - 36% Harley Davidson
  - 18% Suzuki
  - 10% Yamaha
  - 16% Honda
  - 8% Kawasaki
- Motorcycle Type
  - 40% Sport
  - 33% Cruiser
  - 10% Touring
- Ownership
  - 93% owner
  - 37% owned <1 year

Characteristics of Motorcycle Operators

- Crash Type
  - 31% impact with object
  - 24% laid the bike down
  - 15% multiple vehicle intx
  - 17% multiple vehicle not at intx

- Road Type
  - 26% county road/rural area
  - 29% suburban
  - 22% interstate
  - 14% city street/urban area

Characteristics of Motorcycle Operators

- Training
  - 60% motorcycle safety course
    - 48% basic
    - 10% intermediate
    - 8% experienced
- Licensing
  - 89% valid motorcycle endorsement
- 77% under the age of 21 when they began riding

Helmet Type

- STC Helmet Photos (n=242)

- Type
  - 55% full face
  - 10% three-quarter
  - 35% half-shell

- Compliant
  - 80% FMVSS compliant

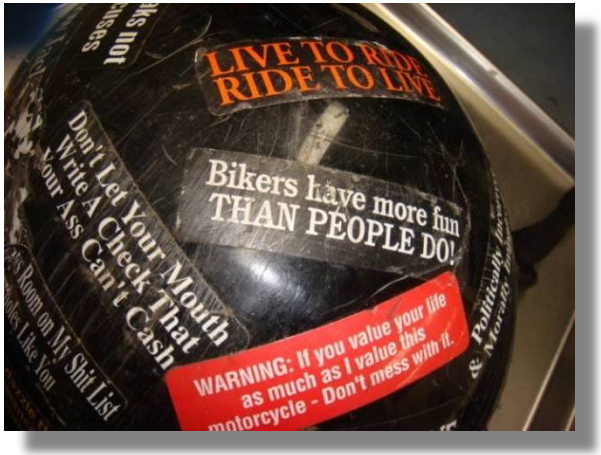

I suffer from CRS
(Can't remember shit)
REMEMBER WHEN SEX WAS SAFE AND MOTORCYCLES WERE DANGEROUS!


Budweiser


Arai
HELMET


08 5374


Guaranteed 100%
PURE BULLSHIT
HELMET LAWS
LET THOSE WHO RIDE DECIDE
HELMET LAWS STILL SUCK!
STROKE IT!


LIVE TO RIDE
RIDE TO LIVE
Bikers have more fun
THAN PEOPLE DO!
WARNING: If you value your life as much as I value this motorcycle - Don't mess with it.


08 5855


HJC


07 7152
FORCE-S
DESIGN

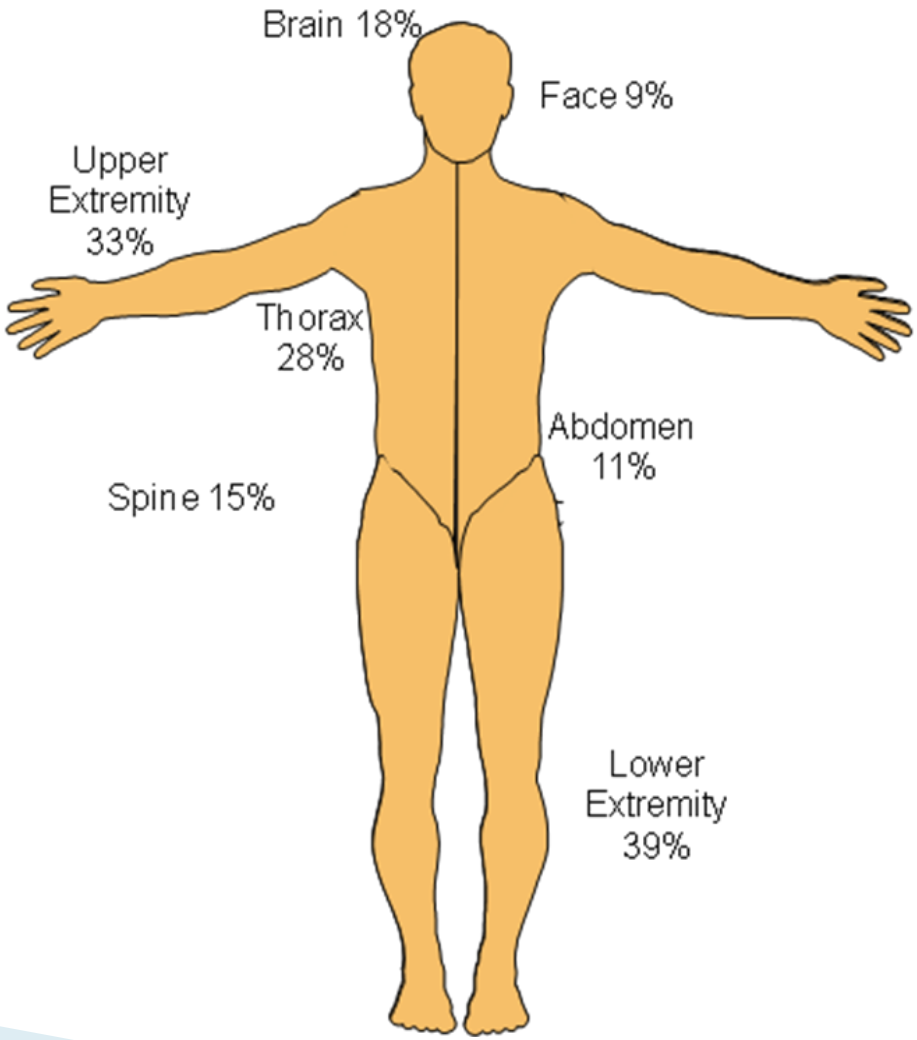

SHOEI


SCORPION
EXO

Injured Body Regions (AIS>1)

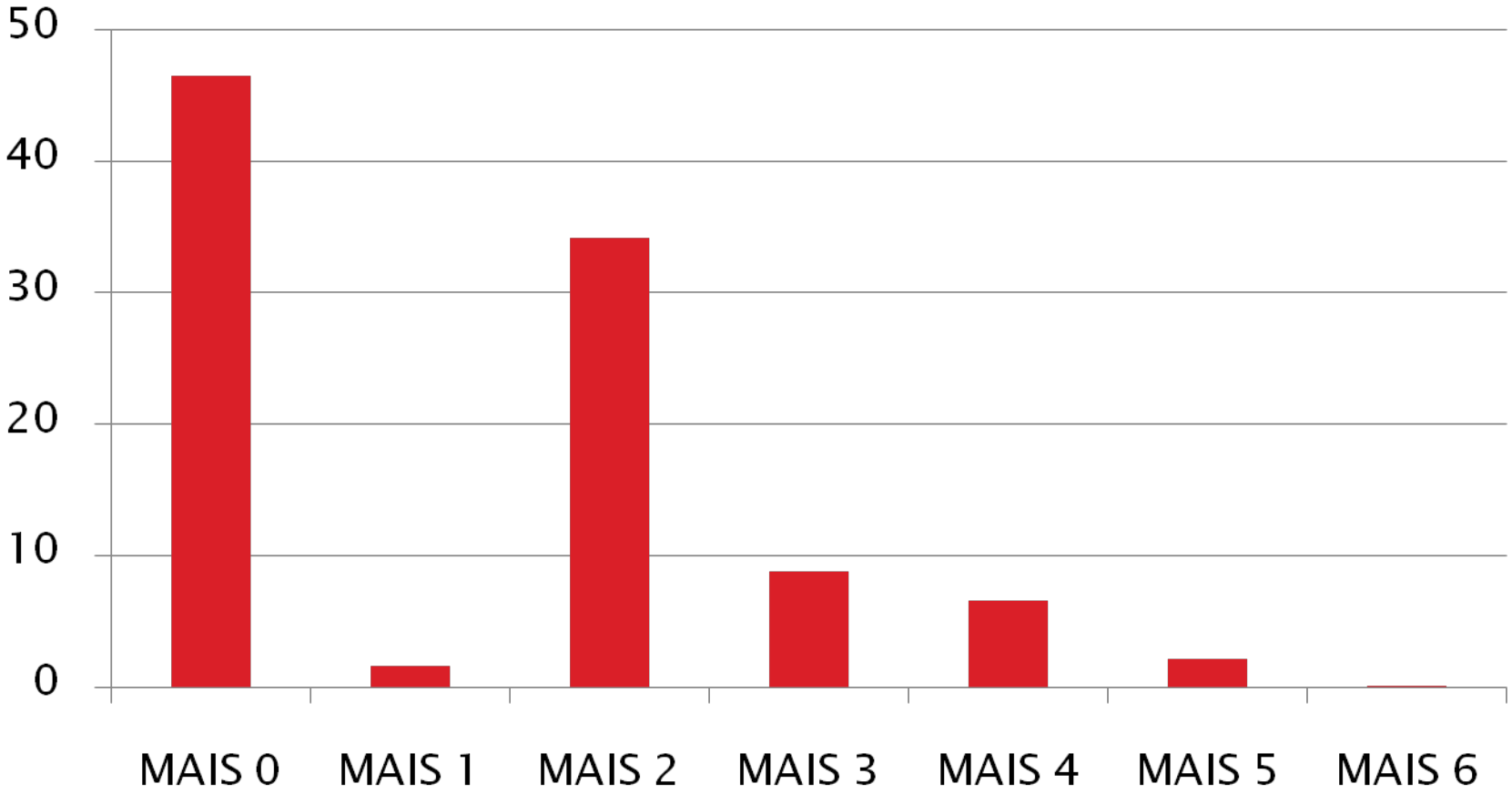
All Motorcyclists admitted to RAC Shock Trauma Center (July 2007–June 2009)

Mean Age = 38 yrs
Mean ISS = 14.9



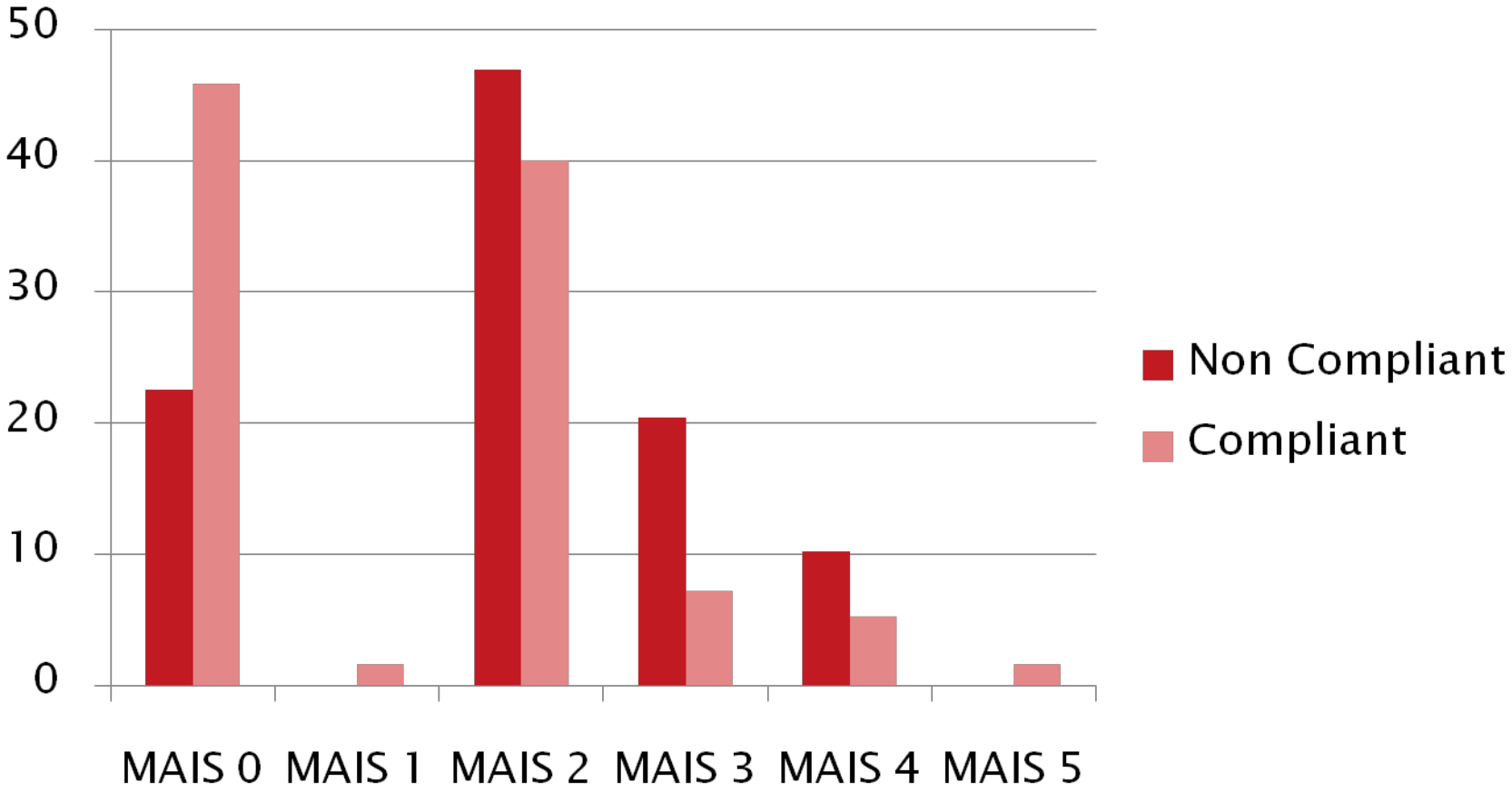
Head MAIS – all patients

(MC identification by trauma registry, n=995, CY 2007–2009)



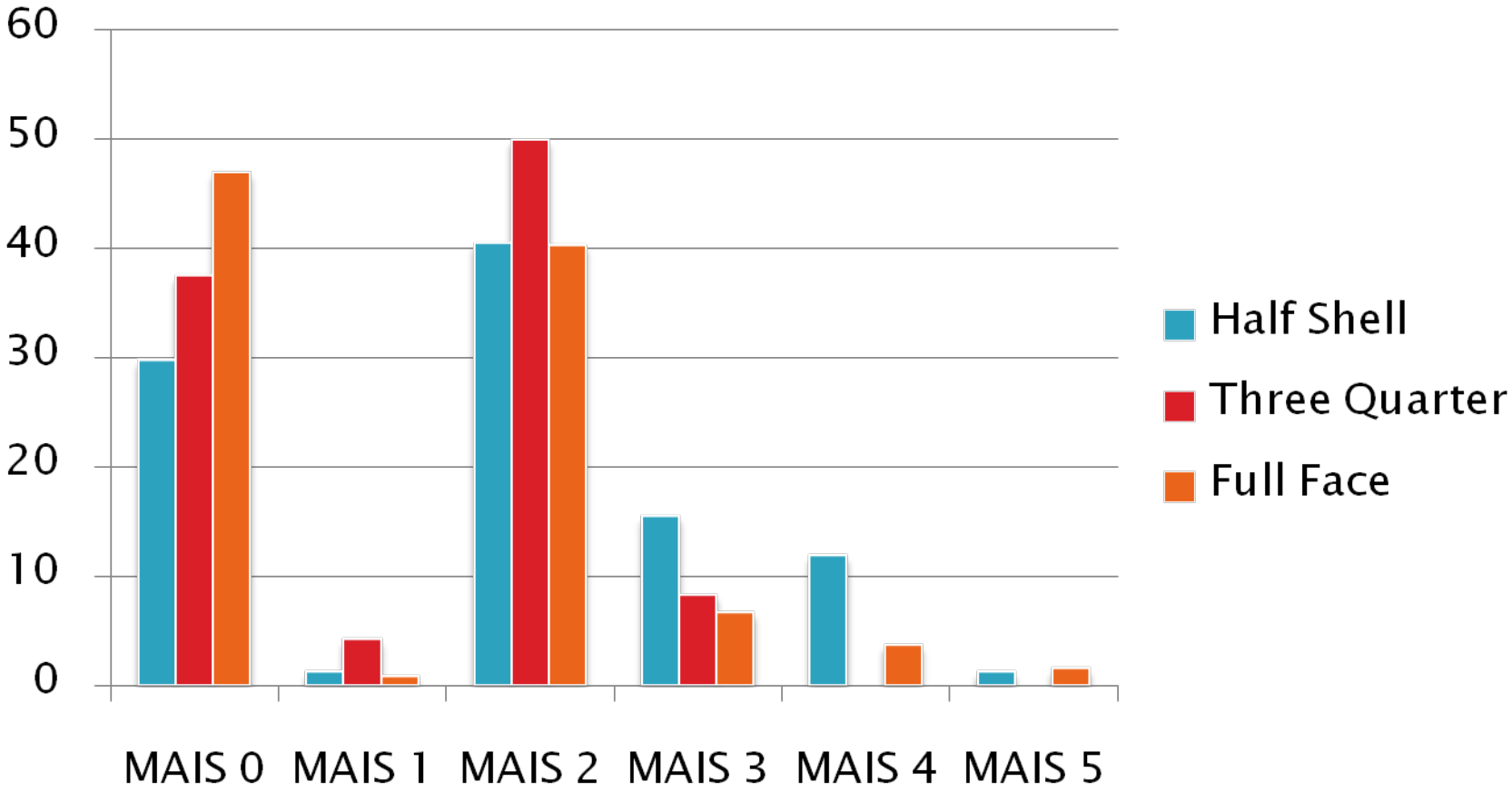
Head MAIS by helmet type

(hospitalized patients)



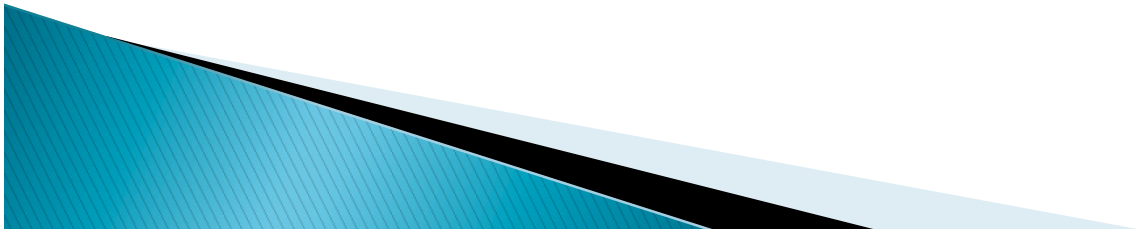
Head MAIS by helmet style

(hospitalized patients)



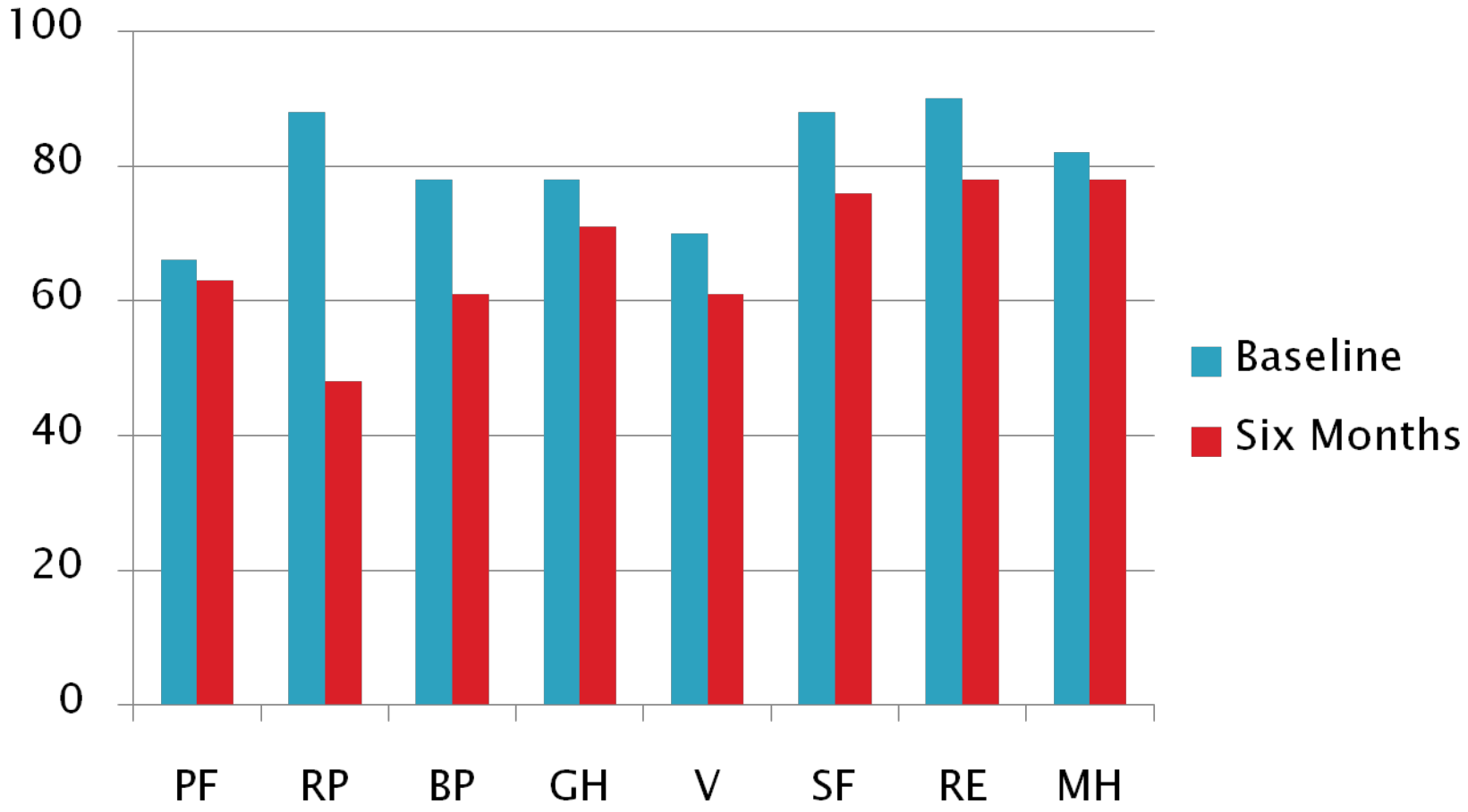
Head injuries
(hospitalized patients)

	Compliant	Non-compliant
Fx Base of skull	6.7% (13/194)	16.3% (8/49)
Fx Vault of skull	1.0% (2/194)	8.2% (4/49)
TBI	53.6% (104/194)	77.6% (38/49)



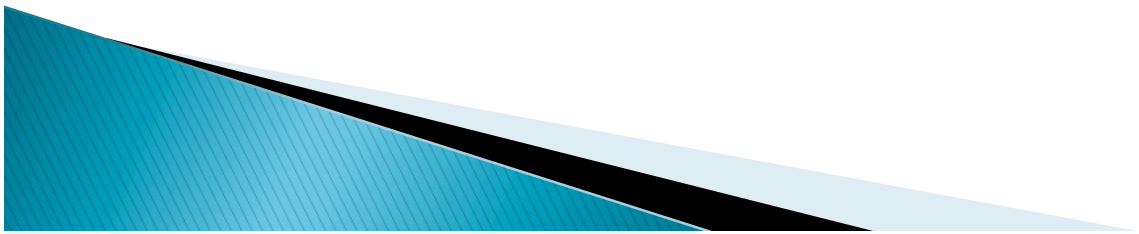
Psychosocial Outcome Data (SF-36)

(hospitalized patients) N=177 (Baseline) / 104 (6 month follow-up)

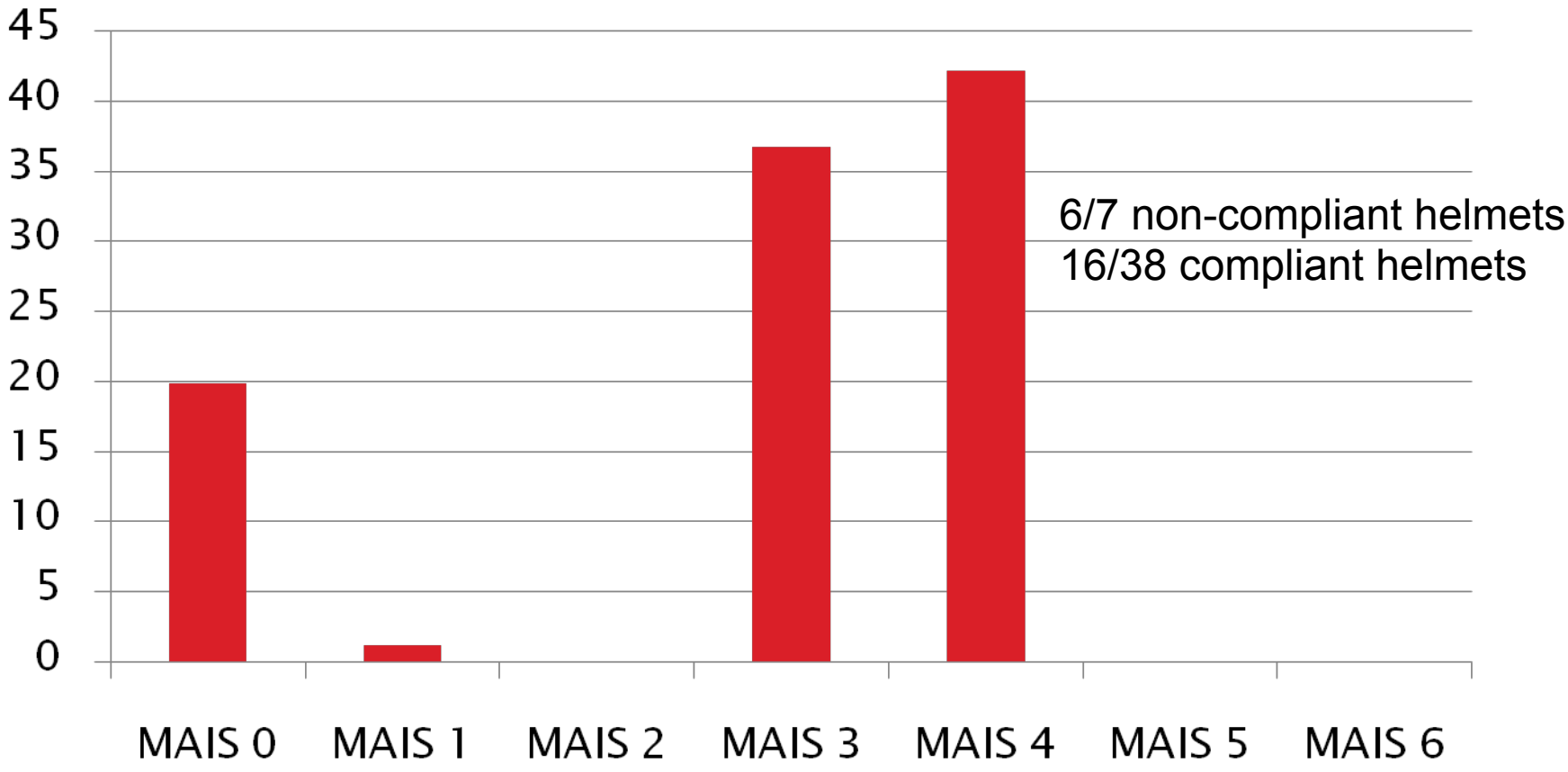


OCME

- Abstracted autopsies – 261 (2007–2009)
- Helmet photos – 45
  - 38 compliant
  - 7 non-compliant

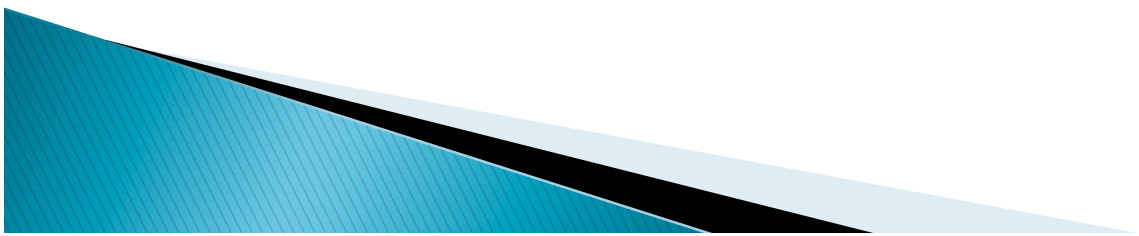


OCME – MAIS Head Injuries



Next steps….

- Reconstruction studies?
  - Biomechanics of injury
  - Effectiveness of safety equipment (all gear)



Next steps….

- Promising Practices
  - Analyze new exposure data (odometer readings = new measure of miles traveled)
  - Analyze new baseline data (motorcycle safety training course test scores and reported riding histories)

- Behavioral Surveys
  - Quantify and analyze knowledge, attitudes and behaviors
    - Motorcycle operators/riders
    - Motor vehicle drivers

For more information

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